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The chief purpose of this publication is to distribute information on aeronautics to the flying personnel in the Regular Army, Reserve Corps, National Guard, and others connected with aviation.

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THE POWER PLANT BRANCH AT WRIGHT FIELD

By a Test Engineer

ON days when there are two or three engines running in the dynamometer laboratory and a like number giving their all at the torque stand, the Power Plant Branch can make the propeller test outfits sound like a silent movie.

The fifteen to twenty civilian engineers are augmented by such celebrities as Major Page, Captains Minty, Gillespie, Lieuts. Irvine, Johnson, Klein and Smith. Major Page has just started his second tour as skipper of the Plant. Lieut. Irvine is Service Liaison Officer and has his troubles. Captain Gillespie, the representative-at-large, is on the road most of the time spreading the gospel. Captain Minty and Lt. Johnson are "king bees" over the Engine Installation Unit and Accessory Test Laboratory.

The business end of the Power Plant begins with the necessary shops for the repair and inspection of engines. A most unique method of engine disassembly by acetylene torches and sledge hammers has been developed here. On a few occasions when engines on test have had a connecting rod failure, the usual method of disassembly has failed and more persuasive means had to be used.

The remainder of the building is occupied by the accessory and dynamometer laboratories. The accessory laboratory is equipped to calibrate and test fuel systems, oil pumps, hydraulic pumps, vacuum pumps, tubes and fittings.

There are two types of dynamometer stands, one for air-cooled engines and the other for liquid-cooled engines. They are essentially the same, in that the power generated by the engine is absorbed through a water brake and electric dynamometer, both of which are mounted in a pivoted cradle attached to a scale for measuring the torque load in order to determine the horsepower. Two large fans on either end of the tunnel in the basement furnish an air blast equivalent to 150 miles an hour air speed as a cooling medium for air-cooled engines. Equipment is also at hand for running air-cooled engines with intake and exhaust conditions equivalent to any altitude up to 30,000 feet. One stand is installed in a cold room, in which the room temperature can be lowered to -60°F. This room is primarily used for engine starting tests and research problems under extreme temperature conditions. The remainder of the dynamometer laboratory is occupied by an assortment of liquid-cooled and air-cooled single cylinder stands used for cylinder, spark plug, fuel and research tests.

The building with the five white towers on the southeast corner of the field houses the torque stands and forms a part of the Power Plant establishment. As stated in previous articles, the engines are calibrated on the dynamometer laboratory and are removed to the torque stands for endurance testing. Certain phases of propeller testing are also conducted at these stands. There are seven stands in all, two for liquid-cooled and five for air-cooled engines. All stands are equipped for fuel, oil, and temperature regulation measurement.

The fuel test laboratory, a building all by itself, is ruled over by Lieut. Frank Klein. In the summer when the temperature in the offices is above 100°F, Lieut. Klein's laboratory, with its air-conditioning system, becomes very popular for conferences. Four variable compression, single-cylinder engines and one Diesel single-cylinder engine form the nucleus of the equipment to determine how many knocks are in anti-knock gasoline. Lieut. Klein and his personnel are continually endeavoring to better the quality of the gasoline used by the Air Corps.

It is impossible to describe in a few words one of the busiest and most extensive activities at Wright Field. The officer personnel of the Power Plant Branch will be very glad to run a Cook's Tour at any time for all visiting firemen. Come and visit us.

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A flight, consisting of Lieut.-Colonel Ralph Royce, Major Alfred E. Kessler and Capt. Robert C. Oliver, in three new PB2-A airplanes, arrived at Selfridge Field on May 15th in 13 hours and 10 minutes of actual flying time from the Consolidated Aircraft plant at San Diego, Calif. The distance traveled is over 2100 miles.

AIR NAVIGATION BY INSTRUMENTS
By Colonel Junius W. Jones, Air Corps

SINCE the advent of airplane instruments and radios for navigation without outside visual reference, I have had many occasions to use this means to extricate myself from dangerous or uncomfortable situations. It was found that the information furnished on maps and the pilots' cross-country envelope was insufficient to enable one to select a new destination once he was in trouble.

As a result of these experiences and the ever increasing complications of the Department of Commerce radio facilities and airway traffic regulations, it was determined advisable to compile all available information of this nature into some accessible form that could be easily referred to in the cockpit. At first, only or principally the information furnished by the Department of Commerce was included in what I termed a "Radio Guide." As requirements demanded, other information, such as traffic regulations, beacon charts, barometric tables, etc., were included, which has completed a Guide that embodies sufficient data for instrument navigation in any part of the United States.

To determine the value and use of the Radio Guide, a questionnaire embodying ten items was submitted to 33 members of the flying personnel at Chanute Field, Ill., and the answers and comments obtained are to be used as a guide in revising and improving the present form. It is obvious, however, that many of those answering the questions did so without any practical experience in bad weather or night flying. The average amount of instrument flying, other than under a hood, per pilot, for the past year is approximately three hours. The average total pilot time is approximately 1,800 hours.

The ten questions above referred to are given below, as follows:

1. Does the Radio Guide contain sufficient information for instrument navigation in any section of the United States with radio aid?
2. Do you include a copy of the Radio Guide with your maps when making a navigation flight with a radio equipped plane?
3. Have you used the Guide in selecting a new course when unable to continue on to your destination on account of dangerous weather or when flying through zero weather?
4. Is the information contained in the guide found to be the latest and most accurate available?
5. Are you able to fly by instruments and refer to any desired information in the guide with comparative ease? a. Day; b. Night.
6. Is the Guide properly arranged and sufficiently simple for the average pilot to use with but very little instruction?
7. Is there any other source of information in the form of maps, circulars, navigation cases, etc., now available in the service that could be substituted for the Guide?
8. Do you prepare the work sheet in advance?
9. Have you used the information contained in the Radio Guide to extricate yourself from a difficult or dangerous situation? If so, how many times?
10. Do you believe that the Radio Guide should be made standard for the Air Corps?

Answers received as a result of the questionnaire are tabulated below.

	Reporting Yes	Reporting No.	Not Reporting
Question 1	27	0	6
" 2	24	7	2
" 3	4	27	2
" 4	27	4	2
" 5	10	19	4
" 6	26	3	4
" 7	4	18	11
" 8	24	3	6
" 9	4	27	2
" 10	24	0	9

Consensus of opinion on Question 10 was that such a Guide was essential in the Air Corps, but should be simplified to facilitate ease of handling and, if possible, reduced in size by including more information on smaller pages. Some few stated that they believed it should be adopted as standard, but should not be carried in the cockpit. Instead, it should be included in the map files of operations offices. Another states - Yes, if revisions could be furnished from a central point. Believe the Radio Guide should be divided into appropriate sections for geographical areas and made standard for the Air Corps. Recommend that the Guide be so arranged that necessary information for any particular route could be extracted and used more conveniently in the cockpit. One officer states that the Radio Guide has its maximum value as a reference guide.

Statistics indicate that only a small percentage of those reporting have ever encountered a dangerous situation where the Radio Guide would have been of material help to them. And even though our records show that the average instrument time per pilot in other than a hooded cockpit to be three hours, it is believed the average over zero or very low ceilings would not be more than thirty minutes.

Based upon the results of the examination on the Radio Guide it was decided to include in the training program an instrument navigation problem with radio aid,

which problem is given hereinafter. Of the officers who have flown one of these problems to date, the results have been astoundingly unsatisfactory. The present plan is to continue this type of training with the ultimate aim being to bring the proficiency of each pilot up to the point that, when found in a dangerous situation, he will be able to extricate himself with comparative ease, or at least fly the airplane safely and intelligently select the proper alternative. This procedure will eliminate the danger of flying under very low ceilings or attempting landings in unsuitable fields which often result in disaster.

It is considered advisable to disregard the answers and comments of those pilots with but little experience and give more weight to those who have pioneered in this work. Even the answers to these questions, including the remarks, indicate that the average pilot is sadly lacking in the knowledge required for successful instrument navigation. It is estimated that at least fifty percent of the pilots at this station (Chanute Field) would prefer flying under dangerously low ceilings to flying by instruments at a higher altitude, which in my opinion is much safer. The examples that are quoted are to include emergencies only. It is not contemplated assigning or encouraging missions through weather over zero ceilings, but it is believed imperative for each pilot to have sufficient knowledge of this type of flying to recover from danger of this nature which he did not anticipate.

PROBLEMS IN INSTRUMENT NAVIGATION WITH RADIO AIDS

1. The following listed information is for the pilot taking the test. He will be assigned a problem in sufficient time prior to the take-off to enable him to study the course to be flown and make the proper preparation for the flight.

a. Radio and instrument equipment will be checked personally by the pilot taking the test prior to the take-off.

b. Barometric pressure will be obtained from the Post Operations Office by radio. The correction for this pressure will be applied to the altimeter and the setting of the index with the barometric pressure will be recorded on a small pad which will be found in the cockpit for that purpose.

c. Department of Commerce regulations pertaining to altitudes, distances from established airways, methods of reporting location, etc., will be strictly complied with.

d. In order successfully to pass this test, the pilot must proceed to his destination with the least practical delay, complying with all existing air regulations enroute. Excessive wandering from the course, variation in altitude, or undue delay in orientation will be considered disqualifying.

e. A sufficient number of weather broadcasts will be picked up enroute to insure the proper corrections for changes in barometric pressure for compliance with air regulations governing altitudes.

f. The problems are so designed to afford the pilot an opportunity for exercising considerable judgment in selecting a new course and destination in the event of dangerous or questionable weather becoming prevalent at the original destination or enroute after the take-off.

The following problem is for the information of check pilot only; and will be transmitted by interphone to the pilot undergoing test at the proper time:

Chanute Field to Cleveland via Lafayette, Indiana.

After passing over Lafayette and having arrived at a point approximately five miles beyond, the pilot will be instructed by the check pilot that weather conditions at various stations are as follows: Cleveland - ceiling dropped from 1000 feet to 500 feet during the last hour, wind NE 25, visibility one-half mile, temperature 28, dew point 26, barometer 29.52 dropping. With similar conditions prevailing at Chicago and Indianapolis. Chanute Field - visibility zero, blowing snow. Terre Haute - ceiling 1000, wind NE 15, temperature 36, dew point 30, barometer 29.65. St. Louis - ceiling unlimited, clear, visibility ten miles.

The pilot will be expected to change his course to Terre Haute and in the event that he shouldn't will be so instructed by the check pilot. Shortly before arriving over Terre Haute he will be given the approximate existing barometric pressure and told that the ceiling is 500 feet. After dropping down to 500 feet over Terre Haute, he will then be instructed to return to Chanute Field.

When within five miles of Chanute Field, the radio will be turned to the interphone and pilot instructed that a weather broadcast will be transmitted from that station for a period of two minutes, after which time receiver will be again switched to radio. The pilot will be instructed to proceed to Chanute Field, dropping through an overcast to an altitude of approximately 500 feet over the field.

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Major Ernest Clark, Captain Earle E. Partridge and 1st Lieut. Charles H. Anderson departed May 18th for San Diego, Calif., to secure three PB2's from the Consolidated Aircraft factory and ferry them to their home station, Selfridge Field.

AERIAL GUNNERY PRACTICE FOR BARKSDALE FIELD "ATTACKERS."

THE 8th Attack Squadron, Barksdale Field, La., was recently ordered to Fort Crockett, Texas, for a period of two weeks for the purpose of conducting aerial gunnery for rear seat gunners with a view to developing combat teams.

The personnel consisted of 16 pilots and 63 enlisted men. Part of the enlisted men were attached from the 60th Service Squadron, 3rd Group Headquarters and 3rd Wing Headquarters. As soon as the nine Group and Wing men had finished firing the course, they were replaced by nine other enlisted men and two officers. A week later, one officer and nine enlisted men from the 8th Squadron reported in. All personnel were quartered and messed on the field. "They must be able to take it, too," comments the News Letter Correspondent, "for in spite of the fact that the sea gulls could tell no difference between the airdrome and the Gulf of Mexico, no one was afflicted except for a few head colds and a lot of mosquitoes."

The mess was well handled and run without profit or loss. The customary growling was lacking, and there was always a rush in the direction of the mess tent around meal time.

Operations were considerably hampered by bad weather and a wet field. Fortunately, the Fort Crockett airdrome has a hard sand base, so that airplanes sink no further than the water level. It was necessary to remove the "pants" to facilitate landings and take-offs. All available time was used to good advantage. Once a ship was caught out and unable to return because of fog until the next morning, the night being spent at Houston.

Two 8-mile courses were used, both lying along the beach, and it required 4 gunnery planes and 4 towing planes to keep both courses in continuous operation. To complete the training, a total of 283:40 hours was flown, averaging 5:33 hours per gunner.

The results were gratifying. Of the 51 men who fired the course, 26 (51%) made "Expert," and 34 (67%) qualified. The total number of rounds fired was 60,244. It takes a lot of firing to wear out 8 gun barrels. The two greatest troubles experienced were caused by the breaking of sears and the breaking or binding of the front sights. Of the 44 malfunctions of armament which necessitated landings, 25 were caused by the sears breaking.

A lot of laughs were had at the story one man told about trying to get into position to shoot the different phases of the course. The man, who was 6'4" tall, gave up after his second run. In asking to be excused, he explained that there was too much of him and too little of the cockpit.

A favorite form of diversion among the pilots was trap shooting from a hand trap. Someone had thoughtfully included a hand trap, several cases of clay pigeons, three cases of ammunition and four shot guns. The sea gulls, however, didn't enjoy it and soon learned to respect that part of the field.

The officers and ladies of Fort Crockett were most thoughtful and kind, inviting the pilots to a club function. Major and Mrs. Fields gave them a delightful dinner. Their hospitality made the stay of the 8th Squadron a very pleasant one.

All in all, it was a very good campaign.

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MONTHLY CONFERENCE AT SAN ANTONIO DEPOT

The monthly Control Area Supply and Engineering Conference and Luncheon at the San Antonio Air Depot was held on May 5th and was attended by 14 officers of various Air Corps stations in that area and the officers of the Depot. Lieuts. (JG) R.D. Hogle and C.C. Howerton, USN, of the Naval Air Stations at Norfolk, Va., and Pensacola, Fla., respectively, then visiting the Depot on an extended air tour, also attended.

Major C.T. McAleer, Signal Corps, in charge of the Signal Corps Radio Section (aircraft radio) at the San Antonio Depot, gave a talk at the conference on "The Analysis of Sound Reproduction in Voice Transmission," with special reference to radio, illustrating with charts and giving demonstrations with an Army radio receiving set, a cathode-ray oscilloscope, and various types of microphones.

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PROGRESS OF CONSTRUCTION AT BOLLING FIELD

With perfect weather conditions prevailing, and aided by the fact that rainfall during the month of April was below normal, the WPA project at the New Bolling Field, under the able direction of Mr. George G. Davies, Superintendent of Construction, hit a new high during that month in the amount of actual work accomplished. At the present time, the project is 33% complete, with 10% of the total work completed during April. Other figures for the past month are as follows: Total cubic yards of dirt moved, 70,000; pipe lines for storm drainage laid, 6,600 feet. To date, 187,000 cubic yards of dirt were moved and 23,000 feet of pipe lines laid. Concrete aprons are approximately 90% completed, and roads are 78% completed. The relief payroll for April was $37,000. A 175,000-gallon reservoir for fire control is being rapidly completed.

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NEW BOMBERS FOR PANAMA

Recently from out of the setting sun came nine new Martin B-10B Bombers, and it was a thrilling and inspiring sight,- their landing at France Field, marking the completion of one of the longest ferry flights in the history of the Air Corps. The flight from Langley Field to the Canal Zone was made via Brownsville, Texas; Mexico, and the Central American countries, and proved very successful, favorable flying weather being encountered almost all the way, and there was no serious motor trouble to cause any delays. The flight was slowed up slightly, however, because of the lack of rapid refueling facilities enroute from Brownsville. Many people from the Army, Navy and the Canal Zone were gathered at France Field to welcome the new equipment to Panama. Such a sight of modern Air Corps equipment has not been witnessed there for many years.

The flight of new planes was led by Col. Oldfield and his pilots from Langley Field. The visiting pilots were honored with a dinner and dance at France Field. They returned to their home station aboard the Army Transport "Chateau Thierry" after an apparently pleasant week's stay at France Field.

"These airplanes are very new," says the News Letter Correspondent, "having been flown direct from the Martin factory to Langley Field to be prepared for the trip to Panama. This type of aircraft has never been flown south of the United States, so it will be interesting to note how they will withstand the atmospheric conditions of the tropics, which are so different from those in the States."

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FORD TRANSPORT FLOWN TO COLOMBIA

One of the four tri-motored Ford Transports belonging to the Colombian Army recently arrived at Bolling Field, D.C., being piloted by Col. Benjamin Mendez, of the Colombian Air Corps. Col. Mendez, who was given flight training at the Primary Flying School at Brooks Field by Major Jack C. Hodgson, Air Corps, now Post Operations Officer at Bolling Field, flew the big ship in for the purpose of meeting the Minister of Colombia, Senor Don Miguel Lopez, and Senora de Lopez, and flying them to their home in Bogota, Colombia, for the summer. The party departed the following day on the first leg of the long trip, which will take them through Guatemala, San Salvador, Panama, Mexico and Central America. No definite schedule was arranged for the trip.

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STEAM GENERATOR FOR ENGINE STARTING

Results of tests at Wright Field, Dayton, O., of a model of a portable steam generator and steam-driven external energizer for engine starting have proved quite satisfactory, and the method seems entirely feasible. Procurement has been instituted for additional units for further test during the coming winter.

The weight of the steam generator will be in the neighborhood of 65 pounds. It will be of the "flash" type, capable of generating steam to the pressure required for starting (from a "cold" start) in less than one minute. Thereafter steam can be generated instantly as required for each start.

The water capacity is sufficient for approximately 20 starts without refilling. Automatic control of the gasoline furnace used as a source of heat is provided. The pressure required for operation of the energizer is approximately 80 pounds.

Two types of energizers are under test, one a 4-cylinder reciprocating type and the other a rotary vane type. The weight of the energizer will not exceed 28 pounds.

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ENGINEERING STUDENTS ON INSPECTION TRIP

Ten officers, students at the Air Corps Engineering School at Wright Field, Dayton, Ohio, left at eight o'clock on Monday morning, May 18th, for their annual factory inspection trip. The purpose of this inspection visit is to acquaint the officers of the School with the latest methods of production, and inspection of airplanes, aircraft engines and aircraft accessories.

According to the itinerary mapped out, the engineering students were to proceed first to the plant of the Curtiss Company at Buffalo, N.Y.; then to the Bausch & Lomb Company and the Eastman Kodak Company at Rochester, N.Y.; to the Wright Aeronautical Corporation at Paterson, N.J.; to the plant of the Glenn L. Martin Company, Baltimore, Md.; to Langley Field, Va., to attend the Annual Conference of the National Advisory Committee for Aeronautics; then to Bolling Field, Washington, D.C., returning to Wright Field on May 23rd.

Major F.M. Hopkins, Jr., Assistant Commandant of the Engineering School, accompanied the student officers on this flight and was in full charge.

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The 18th Composite Wing bugle band, now undergoing intensive training at Luke Field, T.H., under the direction of 2nd Lieut. Clarence W. Gilkes, 23rd Bombardment Squadron, is developing into a first class musical outfit.

NEW TRAINING AIRPLANES DELIVERED AT WRIGHT FIELD

THE year at Wright Field, Dayton, Ohio, has been marked by unusual activity in the development and procurement of training airplanes. Three new models, two of the basic type and one of the primary type, have been delivered and are undergoing acceptance tests. Quantity procurement on all three models is in effect.

Thirty BT-8's (basic trainers) are on order from the Seversky Company. This is a two-place, low-wing, all-metal monoplane, incorporating split flaps and fixed type landing gear. Of these, five have been delivered, two to the Materiel Division, Wright Field, and three to the Training Center at Randolph Field, Texas.

The first of 82 BT-9's (basic trainers) ordered from the North American Aircraft Company was delivered at Wright Field on May 4th. This is a two-place, low-wing monoplane with metal wing, steel tube fuselage, fabric-covered split type flaps, and fixed landing gear. Approximately half of this order is destined for the training of Air Corps Flying Cadets, the other half for Organized Reserve officers.

The first of 26 Primary training airplanes on order with the Stearman Company was delivered at Wright Field on April 25th. This Primary training model is a two-place biplane with steel tube fuselage, fabric-covered, hydraulic brakes, and fixed type landing gear.

Both basic trainers are equipped for instrument landing. The greater number of airplanes in these orders will eventually go to the Air Corps Training Center at Randolph Field.

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IMPROVEMENTS AT POPE FIELD

Improvements continue at Pope Field, Fort Bragg, N.C. Last spring was a busy one in this respect, but it is being eclipsed this year. Most of the old unsightly wooden buildings around the hangars have been removed, and these areas are being landscaped to the best of the abilities of regular enlisted personnel and officers. Approximately one thousand shrubs have been set out, 3,600 cuttings were set in a small nursery plot, and the areas immediately adjacent to the hangars were heavily seeded with bermuda grass. In addition, approximately fifty acres on the two flying fields are being disced, leveled, seeded with bermuda grass, and rolled. Also, the 84 pecan trees and 50 peach trees planted last year are being cultivated, fertilized, and maintained in the best of condition.

Both the officers and noncommissioned officers are taking great interest in gardens and grounds around their quarters. Many excellent gardeners are developing among them, and it has become commonplace for the Air Corps at Fort Bragg to receive compliments from the other branches and from civilians on the appearance of the Air Corps area.

All of the above has been accomplished, in addition to the regular aerial and ground training; cooperative work with the Field Artillery; servicing of approximately 210 transient airplanes per month; sending two airplanes to Fort Oglethorpe, Ga., for one week in March for tactical exercises; furnishing one airplane to Fort Barrancas, Fla., for two weeks in May; one month's field duty for Flight "C," 16th Observation Squadron at Fort Benning, Ga.; and passing creditable tactical and technical inspections with the Field Artillery. Furthermore, the above accomplishments have been achieved entirely by the personnel of the Air Corps without the aid of civilian labor, the Quartermaster Corps, prisoners, or the Civilian Conservation Corps.

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CRISSY FIELD PERSONNEL IN PHOTO MISSIONS

Crissy Field, Presidio of San Francisco, Calif., was recently assigned two interesting photographic missions which will keep its Photographic Section occupied until the early part of the summer. Both are in the Puget Sound area in the State of Washington, and operations will be based at Fort Lewis, Wash.

One of these missions is cooperative with the 29th Engineers - a large mapping project in the northwest, covering ten 15-minute quadrangles and tying together several projects which have been completed in the past. This work will be done with a 5-lens T-3A camera, flown in the standard C-8 Photographic airplane at an altitude of 20,000 feet. It is contemplated that this will require approximately ten photographic days which, with the weather usually encountered in that area, may extend over a month or more. The laboratory work should entail about two months.

The other project embraces the laying of a tactical map, 1:30,000, over an area adjacent to Fort Lewis, to an extent of 36,000 square miles. This will be taken with the same equipment, but flown at an altitude of 15,000 feet.

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The 20th Bomb. Sqdn., Langley Field, Va., is making preparations for the training during two weeks in July of Reserve officers to be assigned to this organization.

ACTIVITIES OF THE MIDDLETOWN AIR DEPOT

For a little statistical data on the activities of the Middletown, Pa., Air Depot, the News Letter Correspondent says, in substance, "Let's look at the record." He goes on to say that during the month of April, with the help of three enlisted pilots, Private, AM 1st Cl. E.R. Camp, Privates AM 2d Cl. E.A. Joyce and V.V. Poupitch, with one each C-27 Bellanca airplane and B-6A Bomber, the Depot with its entourage of officers, civilians, enlisted personnel and what not, has succeeded in hauling a total of 85,503 lbs. of freight over a total distance of 11,260 air miles. Of this total weight, 52,770 lbs. of freight were delivered to Air Corps fields in this district and 32,733 lbs. were returned from these fields.

To quote a few more figures, he says, the Engineering Department came thru with a total of 14 major overhauls, which included two Bombers, eleven Observation and one Pursuit airplanes. Minor repairs were accomplished on 15 airplanes. The Engine Repair Section of this Department made, in addition to numerous minor repairs, a total of 40 major overhauls. The Radio Repair Section says they have two men and enough work for six, so to be sociable they compromised and did the work of four.

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M.A.D. EMERGES FROM HAVOC WROUGHT BY FLOOD WATERS

The Operations Department of the Middletown, Pa., Air Depot recently moved into what was formerly the Disassembly Hangar. After laying linoleum, painting, varnishing and polishing, they stood back to admire their work, when, lo and behold! a flood walked in the door! So the laying of linoleum, painting, varnishing and what not has progressed beyond fond expectations. However, evidence of the damage caused by the recent flood is rapidly disappearing, due to the efforts of a special group of men hired for the purpose. As everybody knows, when a flood goes a visiting, it has no favorites, so the new machinery recently installed in the future Air Corps Shop became a victim, and, says the News Letter Correspondent, "we hereby go on record as stating that this machinery, together with the various equipment, have been dismantled, cleaned, oiled and put back in its original condition, and more equipment is arriving at frequent intervals to be installed as rapidly as possible. The old Operations Hangar is being converted into a temporary Dope Shop, and it is hoped that in the near future the Engineering Section can move into their fine new building. The Dismantling Section is already in operation in its new location, as well as the Test Flight Section. When the entire Engineering Unit gets oriented in their new quarters, watch the production."

The sport of fishing, boating and bathing on the flying field has drawn to a close, and the work of removing houses, horses, cows, stumps, etc., has also ceased. The airplanes, graders and tractors have full control of the field once again. The night lighting equipment went hay wire, but it is back in normal operation again, and it seems that all that remains of the recent flood is the memory plus a few sore muscles.

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MARCH FIELD TAKES ISSUE WITH MITCHEL FIELD

Referring to an item which appeared in the issue of the News Letter of May 1st, to the effect that Air Corps officers comprising the navigation class in the 9th Bombardment Group, Mitchel Field, N.Y., contemplated making a graduation flight to Miami, Fla., involving an over-water "hop" of 407 miles, the March Field Correspondent says:

"Little publicity has been given to the over-the-water accomplishments of the 19th Bombardment Group, stationed since October, 1935, at March Field. But its work easily outshines that mentioned in the article referred to.

"Just as an everyday mission, several officers of the 19th, with the Group Commander, Lieut.-Col. Howard C. Davidson, in charge, boarded the giant Douglas amphibian based at that station for a round-about flight southward over the Pacific Ocean, involving a total of over 800 land miles over water and a total flight of over 950 land miles. The mission took off from March Field at nine ten the morning of May 12th and landed at four fifteen.

"Another accomplishment mentioned by the Mitchel Field Correspondent was the reported first time any Air Corps officer group ever studied at a planetarium. Let it be known that classes at the Griffith Park planetarium in Los Angeles began for the 19th Bombardment Group officers over three months ago, in February, 1936."

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MODEL OF KELLY FIELD AT TEXAS CENTENNIAL

A model of Kelly Field, approximately 5 ft. by 4 ft., including buildings, water tower, hangars, roads, runways and airplanes, will be on display at the Texas Centennial Exposition in Dallas. This model was constructed by students of St. Henry's Academy in San Antonio from photographs furnished by the 22nd Photo Section of Kelly Field. From the interest displayed in a photographic reproduction of this model in one of the local newspapers, it is expected that this model of Kelly Field will be one of the interesting exhibits at the Exposition.

GUNNERY FOR BROOKS FIELD PERSONNEL

The 12th Observation Squadron, Brooks Field, Texas, recently moved to the National Guard Camp at Palacios, Texas, to conduct aerial gunnery exercises, and was to be followed by the 22nd Observation Squadron. This is the first gunnery exercise for the 12th Observation Group since April, 1933, and the first firing with the O-43 type airplane.

Captain John C. Kennedy is acting commander of the 12th Squadron, and Major B.F. Griffin is in command of the 22nd.

A Transport plane was loaned to Brooks Field for the duration of this camp for a daily trip to keep the camp supplied with perishable goods and necessary supplies. Due to the soft condition of the field following every rain, operations were delayed considerably. Communications are by radio, conducted on hourly schedules.

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ASST. SECRETARY OF WAR FLIES TO AKRON

On Saturday, May 16th, the Assistant Secretary of War, Hon. Harry H.Woodring, accompanied by members of his staff and Captains W.L. Ritchie and H.R. Baxter, Air Corps, departed from Bolling Field in a Douglas C-34 Transport for Akron, Ohio, where Mr. Woodring delivered an address on National Defense before members of the Reserve Officers' Association. The return trip to Bolling Field was made on the following day.

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BOLLING FIELD HUMS WITH ACTIVITY

Flying operations from Bolling Field, D.C., were unusually heavy during the past month, with every available plane assigned as frequently as possible. With the advent of favorable night flying weather, the two nights designated each week for night missions find a high percentage of Bolling Field planes on the line. With the exception of two semi-tropical thunder storms, flying conditions were excellent during the entire month.

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QUICK WORK SAVES BOSTON AIRPORT PLANE

Boston Airport was for a time deprived of one of its service type airplanes. The plane had just been ferried from the Middletown Air Depot, after overhaul, by Captain Richards and had not been flown out of the Boston Airport, when one Reserve officer taxied out from the line preparatory to taking a night flight. As he faced the control tower with the landing lights on waiting for the signal to take off, the lower left wing burst into flames. He immediately cut the throttle and switch and the passenger, Private Lacoco, jumped from the rear cockpit with a fire extinguisher. At the same instant, the members of the emergency crew were there with the fire truck and were playing streams of foamite on the wing. With a rapidity almost astounding, the fire was extinguished, but with the loss of the lower wing. A new wing has been installed and the plane is again available for use.

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ELIMINATING THE MOSQUITO PEST

Langley Field, Va., the home of the GHQ Air Force Headquarters, in the land of big mosquitoes, is rapidly becoming devoid of these pests through the efforts of Major Brooke, Flight Surgeon, and Captain Wolfinbarger of the 37th Attack Squadron. The immediate vicinity of the field is being sprayed with a mixture of three parts used oil and one part kerosene. Observation of stagnant water in old bomb craters and other low places show a well spread oil film which is fast eliminating the insect clouds formerly a common sight on the peninsula. As there are droplets of oil on most of the ground in low areas, it is expected that fresh pools will immediately be covered by the oil film.

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RAPID PROGRESS ON LUKE FIELD LANDING MAT

Work on the landing mat at Luke Field is progressing rapidly and, according to the latest reports, the mat will be completed and ready for use prior to the first of September, 1936. The mat is 3,000 feet by 400 feet, enabling a flight of three ships to take off with ease. The field was first surveyed and marked out, then the work of grading and filling in holes began. After this was completed, a six-inch base of crushed rock was spread and rolled. The final work to be done, which is oiling and spreading a fine layer of stone, will take around three or four weeks to complete.

The mat has long been needed at Luke Field, as landings and take-offs from the lava-formed island has caused many a pilot a few gray hairs, due to the ever present possibility of a ground loop caused by the landing gear giving way from hitting the rough terrain.

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The Fourth Observation Squadron, Luke Field, T.H., has finally lost the old reliable o-19's and, with the assignment of three B-12's to the Squadron, all personnel are busily engaged in reading new Technical Orders in order to acquaint themselves with the new equipment. The opportunity to work with new airplanes has promoted intense activity and interest in the work of every individual in the Squadron.

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Lt.-Col. Wm. C. McChord and Major Clinton W.Howard were promoted to Colonel and Lieut Colonel, respectively, effective May 1,1936

Q. What specific missions are visualized for the employment of Bombardment Aviation in a major war?

A. In a major war the enemy will attack us with aviation. The destruction of the base facilities of enemy aviation will, therefore, be a primary mission of our own Bombardment airplanes. For us to have a major war on this continent would mean that our enemy was bringing troops overseas to launch against us. The attack of enemy troop transports prior to and during landing operations will be a primary mission of Bombardment.

The maintenance of an overseas line of communications will be an essential requirement for the waging of a land campaign against us on this continent. The destruction of the naval strength of the enemy available for this purpose will, therefore, be a mission for Bombardment airplanes during such times as the enemy's naval vessels are within economical range of the air bases from which our Bombardment is operating for the accomplishment of the first two missions stated above.

After the enemy's forces are ashore, the destruction of their lines of supply will be a primary mission of Bombardment. The sinking of transports and tankers within economical range, which are carrying supplies for the enemy, the blowing up of docks, warehouses and tanks containing such supplies, and the destruction of important railroad and highway bridges will constitute material contributions to the accomplishment of this mission.

Because of the tremendous psychological effect of such operations, the attack of enemy airplane, ammunition and chemical factories will be a mission of Bombardment. If the conditions are favorable and the airplanes are available, the attack of other munitions factories may be undertaken.

All the above missions, while offensive in nature, would be undertaken for the purpose of enabling the defense of our territory to be successful.

Q. Are extremely long range Bombardment airplanes of great weight-carrying power needed to perform the missions intended for this class of airplanes?

B. By analyzing the missions selected above for Bombardment, it will be found that many of the targets proposed for this class of aviation are reasonably certain to be found within one thousand miles of bases available for the operation of Bombardment airplanes. An enemy force brought overseas for the purpose of invading our territory would either attempt a landing on our own coast or fairly close to our land frontiers. On the other hand, enemy air bases and munitions factories may be at considerable distances from our air bases.

It is probable, then, that we shall be able to reach many objectives with Bombardment planes having from one thousand to two thousand miles range, but that for other objectives a range up to five or six thousand miles may be desirable.

As to weight-carrying ability, so long as a Bombardment airplane can carry a bomb of a size capable of destroying the physical target against which the attack is directed, it is capable of performing the mission. It is believed the carrying of a 2,000-pound bomb will fulfill this requirement. It is probable that considerations of vulnerability of the airplane may dictate the greatest possible use of relatively small Bombing planes, just large enough to carry the bomb and gas load required. But to widen the field of employment and secure the greatest effectiveness for this class, there will also be required a number of very long-range Bombers of great weight-carrying capacity. On long-range missions the time consumed, the flying hazards to be overcome, the navigational difficulties to be solved and the attack menaces to be surmounted will make it desirable to carry as large a bomb load as possible. It would appear from the foregoing considerations that a well balanced Bombardment force would comprise a preponderant percentage of Bombers having from one thousand to two thousand miles range, carrying a 2,000-pound bomb; that a smaller percentage would be larger Bombers, ranging in capacity to the very heaviest type which can be successfully designed, built and flown.

Q. What is meant by "economical range" when speaking of combat missions for Bombardment?

A. This term as usually employed, that is in connection with the assignment of Bombardment combat missions, means to select from among a group of targets, approximately equally remunerative, those targets lying closest to the operating base of the Bombardment concerned. It means, further, to seek to discover remunerative targets for bombardment within relatively short ranges rather than to select the targets which are readily presented at considerably greater ranges.

The above course of action is predicated upon the fact that the longer the range involved in the execution of a Bombardment mission, the greater are the following five factors:

a. Time consumed in executing the mission.

b. Amount of exposure to hostile attack.

c. Amount of exposure to mechanical failure.

d. Expenditure of fuel and life of the aircraft.

e. Expenditure of energy of the personnel.

From a still broader viewpoint, the shorter ranges are more economical in that to accomplish missions at short ranges requires a much smaller, and consequently much less expensive, Bombardment airplane to carry a single bomb of the maximum size, than would be required to carry the same bomb over a considerably greater distance. This is due to the fact that in any high speed Bombardment airplane, the weight of the gasoline and oil consumed per 500 miles - for example - bears a relatively high ratio to the weight of a 2,000-lb. bomb, which at present is the maximum weight considered necessary for the material destruction of the targets against which it is contemplated to launch Bombardment aircraft.

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AWARDS PRESENTED TO CAPTAIN STEVENS AND LIEUT. HARMAN

SPRING showers halted long enough at Wright Field, Dayton, O., on May 12th to permit the ceremony prepared for the presentation of the Oak Leaf Cluster to the Distinguished Flying Cross to Captain Albert W. Stevens, and the Soldier's Medal to Lieut. L.F. Harman, to take place out-of-doors as planned. The lawn southwest of the Administration Building was the scene of the occasion, and looked its best enlivened by the interest of many spectatord who had come to look on and offer congratulations.

Captain Stevens received his award for the successful consummation of the Stratosphere Flight which, besides adding valuable data in the field of science, achieved the world's altitude record. Lieut. Harman was awarded the Soldier's Medal for valiant rescue work performed at the risk of his life upon the occasion of the crash of the Boeing Bomber last October, in which Major P.P. Hill and Mr. Leslie Tower, Boeing pilot, lost their lives.

Major-General William E. Cole, Commanding General of the Fifth Corps Area, and Staff, came from Columbus, Ohio, to make the presentations, and Captain A.W.Brock, Adjutant, read the citations.

Captain Stevens was further honored that night by the presentation of a very beautiful bronze plaque at a dinner given by the aeronautical committee of the Dayton Chamber of Commerce. A duplicate of the plaque was presented to Captain Orvil A. Anderson, and accepted for him by Brigadier-General A.W. Robins, Chief of the Materiel Division, since Captain Anderson could not be present. Captain Anderson was pilot of the big balloon on the trip into the stratosphere.

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SPEED - PLUS
By the Langley Field Correspondent

Communication between ground and air units is daily becoming more and more important to the Air Corps. Too often, ignorance of the communications facilities at hand holds up certain phases of our daily work, resulting in useless delay, rasped nerves, irritated superiors and a sense of inadequacy among "those who carry out the orders." SPEED is an essential factor these days. Consider that every day faster planes are being built. Consider that communications - ground, air and ground, air and air - are being perfected and speeded up, allowing much faster coordination. The days of the Pony Express are gone these many years - may they rest in peace - but in many instances personnel are still working under the mental handicap of "those good old days."

Today the human factor needs a more thorough tuning and speeding up than much of the complicated machinery of this age. Headwork - a step beyond just plain common sense - good headwork, will provide a means to the end. For instance:

A few days ago, Post Headquarters, Langley Field, Va., required certain information relative to the immediate transfer of an enlisted pilot of the Station Complement to another station. It was essential that the information be secured as soon as possible to be incorporated in orders then being compiled. Pvt. Joe E. Barton, the individual in question, was at that particular moment piloting a B-10 on a bombing mission at an altitude of some 7,000 feet and an indeterminate number of miles away from Langley Field, and was not expected to return to the airdrome until quite some time later. A hurried telephone call from the organization first sergeant to the Operations Officer, who immediately contacted Private Barton by radio and secured the required information, enabled Post Headquarters to proceed with the compilation of orders.

From the time that Post Headquarters telephoned the organization first sergeant until the moment that Post Headquarters had the desired information, less than five minutes had elapsed! Radio and telephone, the modern miracle workers, had made this possible. But - and there is a moral somewhere in this - the human equation was no less to be complimented than the mechanical factors concerned in this accomplishment. It was split-second

(Continued on page 11).

NEW AIRPLANES FOR MARCH FIELD

Six new and swift airplanes will be added to the complement of the 19th Bombardment Group at March Field, Calif., in August, according to a recent announcement of Brigadier-General Henry B. Clagett, commanding the First Wing of the General Headquarters Air Force.

First of the planes scheduled for delivery during the "dog days" will be five Martin B-10B Bombers. These will reinforce the 19th Bombardment Group to a strength of 14 Martins. With the exception of minor improvements, the new planes are much the same as the present nine in service at March Field.

The other plane expected in August is one of the DC-34 Douglas Transports ordered by the Army. It will be slightly larger than the flagship of the GHQ Air Force, based at Langley Field, Va., and now in California on official business. Designed principally to haul freight, it will have a track running down its center to facilitate handling material. Seats may be placed in it, however, to carry airplane crews and administrative personnel to distant points.

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91ST OBSERVATION SQUADRON IN MANEUVERS

The 91st Observation Squadron, with the 15th Photo Section attached, stationed at Crissy Field, Calif., recently completed field maneuvers with the Sixth Brigade. For seventeen days, April 12th to 29th, inclusive, the organization lived in their camp at the Watsonville Airport, about 100 miles south of San Francisco, and a few minutes' flight from the Infantry, Cavalry and Artillery camps.

Daily missions of various types were carried out - Liaison, reconnaissance (day and night), aerial photography, com communications (visual and radio), formation, and aerial gunnery.

A dual purpose was accomplished in the maneuvers - the field exercises and the quarterly test of airplanes with full military equipment.

Credit must be given the Squadron Supply Sergeant for saving many shins and much discomfort by the ingenious idea of painting the tent pegs white.

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BACHELORS THINNING OUT AT CRISSY FIELD

Cupid has been doing a land office business at Crissy Field, Calif. Since the first of the year there were no less than six weddings in a command of 150 men. The newlyweds are 1st Lieut. Austin A. Straubel, Air Corps; 2nd Lts. Homer B. Bernard, John B. Preston and David R. Nelson, Air Reserve; Staff Sgt. H.E. Etheridge and Pvt. John B. Steele, Air Corps.

FIRST PURSUIT GROUP IN THE FIELD

The First Pursuit Group, Selfridge Field, Mich., is at this writing based in the area Midland - Bay City - Saginaw and Camp Skeel, Oscoda, Mich., for a two-weeks' period of Group maneuvers. The 56th Service Squadron, with 4 officers and 100 enlisted men, departed by motor convoy at 6:00 a.m., May 19th, for Camp Skeel, to establish a gunnery camp. The 57th Service Squadron, with 7 officers and 150 enlisted men, was scheduled to depart at 6:00 a.m., May 21st, by motor convoy, to establish camps at Midland, Saginaw and Bay City, Mich. Headquarters Flight, and the 17th, 27th and 94th Pursuit Squadrons, with 52 airplanes, 77 officers and 177 enlisted men, were to depart for the training area on May 22nd. Group Headquarters was to be established at Bay City. The Group plans to return to the home station on June 6th.

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LIEUT. PARKS DIES IN AIRPLANE CRASH

Second Lieut. James T. Parks, Air Reserve, was killed instantly when the Pursuit airplane which he was piloting from Selfridge Field, Mich., crashed from an altitude of about 100 feet near Peck, Mich., on May 10th. Lieut. Parks was on inactive status and had been assigned to Selfridge Field for inactive flying training since 1932. He was a ballistics expert of the Detroit Police Department. At the time of the accident he was apparently trying to find a place to land, but when at about 150 feet altitude the plane nosed over and crashed. He is survived by his wife, Marguerite, and daughter, Marjorie.

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SPEED - PLUS

(Continued from Page 10).

thinking - and no mechanical gadget has yet been devised to compare with the complicated, yet simple, mechanism of the human mind - and taut nerves relaxed, superiors smiled and nodded approval, and a glow of honest accomplishment suffused the beings of "those who carry out the orders."

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NARROW ESCAPE FOR LIEUT. CHENNAULT

Recently, while engaged in aerial gunnery practice at Barksdale Field, La., the .50 calibre gun in the plane piloted by 2nd Lieut. John S. Chennault, of Selfridge Field, exploded, apparently due to a weak barrel locking spring. Blinded by fumes, Lieut. Chennault almost flew into a wooded area, but he recovered and made a safe landing in the field. Parts of the gun fell in the cockpit, and a portion of the fuselage was torn from the airplane.

Hamilton Field Section

THE SEVENTH BOMBARDMENT GROUP

The 7th Bombardment Group, now stationed at Hamilton Field, San Rafael, Calif., was organized as a complete unit at March Field, Calif., in October of 1931. The Group remained at March Field until December, 1934, when it was transferred to the newly completed Hamilton Field, under the command of Lieut.-Colonel C.L. Tinker.

The period of sixteen months which has elapsed since the arrival of the Group at Hamilton Field has been one of experimentation in Group and Squadron organization, also one of hard work, but probably the most beneficial in the 7th Group's history.

In January, 1935, two B-12 airplanes, piloted by Capt. A.G. Hamilton and Lt. B. Walsh, Air Corps, were ordered to Dayton, thence to join the Cold Weather Test Flight under the command of Lieut.-Colonel Ralph Royce. Capt. Hamilton received commendation for his excellent work in connection with this flight.

In April, 1935, bomb sights and machine gun mounts for the B-10 airplanes arrived, and training in gunnery and bombing was conducted for the first time at Hamilton Field.

The only available place in the vicinity of Hamilton Field for a gunnery range is along the coast line. Due to the prevalence of coastal fogs, this area can be used only a small percentage of the flying days. Despite this condition and the fact that the Group or separate squadrons have conducted or participated in numerous maneuvers and field exercises, squadrons have taken every available opportunity to complete firing requirements, and all squadrons will complete their TR 440-40 gunnery training before the end of this training year.

Training in aerial bombing has progressed quite rapidly and has been relatively satisfactory. All members of the 7th Bombardment Group have completed bombing under the requirements of TR 440-40 and qualified as expert bombardiers. They are now conducting bombing as required by the new "tentative" TR 440-40. It is anticipated that, due to the more rigid requirements of the new regulations, the number of bombardiers qualifying will be materially reduced.

In addition to the regular training required in aerial bombing, this Group has conducted considerable bombing at altitudes from 15,000 to 20,000 feet, and one mission at 23,000 feet. The results of this high altitude bombing, while not unsatisfactory, are not as good as can be expected when more training has been accomplished and all instruments and bomb sights properly calibrated. It is believed that the greatest errors in high altitude bombing occur due to the pilot's inability, when near the service ceiling of the airplane, to fly the airplane as accurately as is required. Accuracy is improving as pilots gain more experience in this work. Bombing at high altitudes is made more difficult by the use of oxygen and the freezing of instruments. It has caused each pilot and bombardier to realize that accurate aerial bombing has as its first prerequisite carefully and accurately calibrated flight instruments and a pilot who can fly the airplane accurately with instruments alone.

When the GHQ Air Force was formed, a complete reorganization was effected to comply with the test tables of organization. At this time the 69th Service Squadron was organized and attached to the 7th Bombardment Group.

In August, 1935, special training was started by the 11th Bombardment Squadron for a demonstration of formation and bombing to be held at Fort Leavenworth, Kansas, in October. Three B-12 airplanes, under the command of Captain John G. Moore, were sent to Fort Leavenworth to participate in the demonstration.

This Group participated in numerous maneuvers and concentrations during the past year. Group and First Wing concentrations have been held in the Los Angeles area, San Diego, March Field, San Joaquin Valley, Mojave Desert, Salt Lake and Denver areas, and at Hamilton Field. During these concentrations, all pilots have become familiar with the majority of landing fields in the western part of the United States, servicing facilities at these fields and the problem of maintaining airplanes and equipment under varying and different conditions.

Each tactical Squadron of the Group has had one field exercise of at least a week's duration, operating independently. The 11th Squadron operated from Coalinga, Calif., during the latter part of June, in weather so hot that all maintenance had to be completed prior to 7:00 a.m., as after that hour the metal of the tools, engines and airplanes became so hot as to burn the mechanics' hands.

V-7029, A.C.

The 31st Squadron operated from Medford, Oregon, without undue difficulties. The people of Medford made their stay a pleasant one through their cooperation in procuring badminton courts, skeet ranges and other recreational facilities for the use of the personnel of the Squadron.

The 9th Squadron spent their week of exercises at Visalia, Calif., and encountered much the same difficulties as those of the 11th Squadron at Coalinga.

The 88th Observation Squadron was transferred from Brooks Field, Texas, to Hamilton Field and attached to the 7th Bombardment Group in October, 1935. It is essentially a long range Observation Squadron and has participated in 1st Wing Maneuvers and Concentrations since the organization of the GHQ Air Force. Since its arrival at Hamilton Field it has received better airplanes and has conducted extensive training in air navigation and other phases of long range observation.

The 7th Provisional Bombardment Group, consisting of available airplanes and personnel of the 7th and 19th Bombardment Groups, participated in the GHQ Maneuvers in Florida in December. The outstanding accomplishment of this maneuver was the rapidity with which the airplanes concentrated at great distances with the necessary equipment for immediate operation. This was especially shown when the 7th Bombardment Group flew from March Field, Calif., to Vero Beach, Fla., a distance of 2300 miles, in an elapsed time of 21:15 hours.

As rapidly as pilots are qualified in instrument flying in the BT type airplane, advanced training in aerial navigation by instruments is being accomplished. During these navigation problems, the front part of the pilot's cockpit enclosure is covered with tape or paint. Excellent results and valuable training in both aerial navigation and instrument flying are being obtained.

A number of the B-12 airplanes from this station are being shipped to the Hawaiian Department, and have been replaced with B-10B airplanes. The tactical squadrons are now occupied in calibrating instruments, installing oxygen equipment, bomb sights and machine gun mounts in preparation for continuation of training in bombing and gunnery.

Due to the limited recreational facilities at this station, the problem of athletics and other means of relaxation is acute. The officers and cadets have partially solved the problem by challenge matches between organizations in skeet shooting, badminton and soft ball whenever possible. The enlisted personnel are developing great interest in badminton, and combat crew personnel are taking an active interest in skeet shooting. The need for a gymnasium and theatre is very urgent.

The Group organization, as it now exists, is composed of the following:

Commanding Officer 7th Bombardment Group
Lieut.-Col. C.L. Tinker

Staff:
S-1 - Lieut. E.W. Suarez
S-2 - Major K.N. Walker
S-3 - Major K.N. Walker
S-4 - Captain E.T. Noyes

Armament:
Captain C.G. Williamson
Captain M. L. Harding

Communication:
Captain R.H. Lynn

9th Bombardment Squadron:
C.O. - Major J. M. Davies
8 Regular officers
5 Reserve officers
2 Flying Cadets

11th Bombardment Squadron:
C.O. - Major C.H. Ridenour
7 Regular officers
4 Reserve officers
2 Flying Cadets

31st Bombardment Squadron:
C.O. - Major H.D. Smith
6 Regular officers
5 Reserve officers
1 Flying Cadet

88th Observation Squadron:
C.O. - Major C.E. Giffin
5 Regular Officers
7 Reserve Officers

69th Service Squadron:
C.O. - Major J.W. Sory
6 Regular Officers

70th Service Squadron
C.O. - Major D.M. Myers
6 Regular Officers

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ORGANIZATION OF TECHNICAL DIVISION FOR MAINTENANCE OF 7TH BOMBARDMENT GROUP

1. This system of maintenance has been in operation since October 1, 1935, by the 7th Bombardment Group, Hamilton Field, and is organized to function as outlined below:

a. All maintenance personnel for airplanes and allied equipment are relieved from duty with combat squadrons, service squadrons, and Station Complement and placed on special duty with an organization known as the Technical Division.

b. The Technical Division operates under a Technical Executive and is organized with the following branches:
(1) Maintenance Engineering
(2) Base Engineering

(3) Armament
(4) Communication
(5) Supply

2. The responsibility and organization of the above mentioned branches are as indicated below:

a. The Maintenance Engineering Branch is responsible for 1st and 2nd Echelon maintenance of airplanes and auxiliary equipment, less maintenance of armament and communication equipment and servicing of airplanes with ammunition, bombs and pyrotechnics. It is organized into two sections, the Flight Section and the Preventive Inspection and Unit Change Section, as follows:

(1) The Flight Section is responsible for the servicing; daily and preflight inspections of all airplanes and engines, including adjustments and replacement of small parts. Enlisted personnel to be assigned to the flight section consists of the following:

(a) One line chief.
(b) Flight chief and assistant flight chiefs for each combat squadron.
(c) Crew chief and assistant crew chief for each airplane. (Note: Single engine airplanes should not need an assistant crew chief.)

(2) The Preventive Inspection and Unit Change Section is responsible for the 2nd Echelon maintenance of airplanes and engines, including preventive inspections and changes of major units and assemblies, less Technical Order Compliance Changes. Enlisted personnel of the Preventive Inspection and Unit Change Section is organized into crews, consisting of one noncommissioned officer and six (6) other enlisted men. (Note: The crew chief and assistant crew chief accompany the airplane whenever Preventive inspection or Unit Changes are made and assist crews detailed therefor). For field service, crews are augmented from the Base Engineering Branch at the rate of one welder, one sheet metal worker, one dope and fabric man, and one wood worker for each combat squadron.

b. The Base Engineering Branch is responsible for all Technical Order Compliance Changes, 3rd Echelon maintenance, maintenance of flying field, visiting airplanes and crash boats. It is organized and divided into five sections: The Aero Repair Section, the Shop Section, the Flying Field Maintenance Section, the Airway Section, a Rescue and Crash Boat Section, as follows:

(1) The Aero Repair Section is responsible for Technical Order Compliance Changes, which are not made at depots; maintenance and repair of airplanes and installation of units beyond the facilities of the Preventive Inspection and Unit Change Section; salvaging and reclamation of airplanes incapable of flight.

(2) The Shop Section is responsible for the repair of equipment and supplies at the base, manufacture of tools and supplies not procurable through supply channels and inspections, maintenance and repair of parachutes and flying clothing. This section also furnishes mechanics to augment Preventive Inspection and Unit Change crews for field service as outlined in paragraph 2a, above.

(3) The Airway Section is responsible for the servicing, inspection and maintenance and repair of all transient airplanes.

c. The Armament Branch is responsible for the installation, inspection, maintenance, and repair of Armament Equipment at the base and in the field, loading and fuzing of bombs and servicing of airplanes with ammunition, bombs and pyrotechnics. For effective operation, enlisted personnel of the Armament Branch should be organized into crews of sufficient strength to maintain and service the airplanes of the combat squadrons and instrument section, including bomb sights.

d. The Communication Branch is responsible for the installation, inspection, maintenance and repair of communication equipment, and the operation of ground equipment. This branch is organized into two sections: The Base Section and the Airplane and Field Section, as follows:

(1) The Base Section is responsible for the installation, inspection, maintenance, repair and operation of the Base Radio Station, the Base Alert Net, and the Group Communication System.

(2) The Airplane and Field Section is responsible for the installation, inspection, maintenance and repair of the airplane radio equipment and field radio sets, setting up and operating of ground stations in the field; and the installation, maintenance and operation of the field telephone service. For effective operation, enlisted personnel of the Communication Branch are organized into crews of sufficient strength to maintain and service the airplanes of one combat squadron.

Note: While the combat crews are under the direct command of the squadron commander, they are charged with the daily maintenance of armament and communication equipment installed in airplanes.)

e. The Inspection Section is responsible for all Technical Inspection as prescribed by Circular 120-2, OCAC.

f. The Supply Section is responsible for the procurement, storage, and issue of all classes of equipment and supplies required to maintain the flying units at the Base or in the field.

3. The 7th Bombardment Group has found this maintenance system to be very efficient. It has the following advantages:

a. Places the responsibility of all

maintenance under one head and section, instead of two or more as under the present organization.

b. Provides for flexibility in the strength of a command, in that the personnel requirements are based upon the number of airplanes to be serviced.

c. Simplifies the supply problem, saving time and duplication of paper work and efforts required in the requisitioning and obtaining of parts and supplies.

d. Allows for the organization of enlisted personnel into crews and shifts to maintain airplanes in commission during normal flying hours.

e. Provides for specialization of crews to perform preventive inspections and unit changes, which considerably reduces the maintenance man hours normally required to perform any particular inspection or unit change.

f. Allows for a more thorough supervision of inspections than is now provided under the provisions of Circular 120-2, OCAC.

g. Possible to provide sufficient labor saving devices necessary for thorough preventive inspections, economically impractical if more than one maintenance organization is operated at a station.

h. Allows a reduction in number of clerical personnel required to maintain technical records, files, and preparation of technical reports.

i. Allows tactical commanders to give their full time for planning and training of the combat personnel.

4. Much of the success of this system has been due to the untiring efforts of Major Devereux M. Myers, Group Maintenance Executive, and Major Delmar H.Dunton, Assistant Maintenance Executive.

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BOMBING ACTIVITIES OF THE 7TH BOMBARDMENT GROUP

DUE to the organization of the GHQ Air Force as an integral part of the military forces of the nation, with its entailed necessities of mobility, calling for rigid tests of its objective functions, the trend of Bombardment missions has resulted in changed ideas on normal methods of training.

If the ideal bombing unit is to be perfected, all of its personnel must continuously maintain their proficiency. The old maxim has it that practice makes perfect and, with this point in view, continuous year-round bombing and gunnery has been in progress in this Group, in addition to the flying and navigation training required by the new regulations. Bomb sights and ground trainers were received and installed. Instruction on the new sight was started in the shops and on the trainers, and maintenance and repair facilities for the sights were devised. The real work of bringing the entire Group up to a uniform standard of proficiency received its initial impetus. This brought a major problem to the fore. The Group had to hurdle the task of providing primary training for all of its personnel in the fundamentals of bombing involving the use of the new sight.

Due to various contingencies which had arisen - "CCC", "Air Mail," et al, an officer or enlisted man who had participated in bombing training within a few years prior to this time was the exception rather than the rule. None were familiar with the operation of the new bomb sight. Thus, before a definite program for continuous bombing practice could be begun, rudimentary instruction was in order.

Classes were conducted in the use of the sight, and all three bomb trainers were put into continuous operation in order that personnel of the three tactical Bombardment squadrons might have reasonably thorough ground instruction before being permitted to operate on actual bombing or camera obscura missions. Every pilot was given at least eight hours trainer time before starting camera obscura. When the technique of pilot directing had been mastered, the individual, upon completion of the prescribed initial training, was released for bombing practice.

The Group has a target just off the field in the shallows of San Pablo Bay, but the use of this target is frequently limited by fog and low ceilings, especially in the winter months. Therefore, in order to carry out our extensive training program and conduct many required service tests on complete sets of new type equipment, it has been necessary to use the Mather Field Bombing Range in addition to the Hamilton Field Range. A permanent camp is kept there for this purpose and one or the other of the Bombardment Squadrons are encamped at Mather Field for six months of the year.

The new Bombers and equipment were an unknown quantity insofar as actual bombing and gunnery were concerned. This meant that while initial instruction was being given, bomb racks and bomb sights must be tested individually and collectively, suitability of certain arrangements determined, and changes recommended, where necessary. So, while the training was in progress, certain personnel were concentrating on testing the bombing equipment, making necessary initial installations and changes, and in determining the best procedure which was later prescribed for actual bombing practice.

Extensive test bombing at all altitudes and speeds within the range of the planes was conducted by personnel of the three squadrons in the period from May to the

first of October. During that time, bomb sight and personnel limitations were determined and ballistic data was tested so that everything was ready for the start of actual bombing under regulations for record and practice, in October, 1935. For this record and practice bombing in accordance with the regulations, the squadrons moved, individually, into camp at Mather Field, where there is a satisfactory bombing range. The local range was still being used for various tests prescribed by higher authority. This included tests in extreme low and high altitude bombing and in the design and test of a sight for use at altitudes below that at which the standard sight may be used. These tests, which are still being conducted, include bombing missions as low as two hundred feet and some at the actual service ceiling of the airplane. In one instance, a mission was carried out at an altitude so near the actual ceiling of the airplane that each time one of the five 300-pound bombs was released the plane would gain another 300 feet altitude, which could just barely be held.

Each squadron took its turn in camping at Mather Field while it completed all of its assigned and attached personnel in the required qualification bombing. While they were there for that purpose, they concentrated on bombing, and missions were conducted continuously from early in the morning until late in the afternoon of every day in camp. Under that program, one squadron dropped over 1100 bombs and completed practically all of its "TR. 440" bombing in less than ten days. The other two squadrons, handicapped by the comparatively bad winter weather, still have daily averages of bombs dropped of over 100 each. Practically all personnel of the Group have completed their qualification under the old regulations, and one squadron has again moved to Mather Field to start bombing under the new tentative T.R. 440-40 which is being tested.

A two-weeks' maneuver of the entire 1st Wing was held in the San Joaquin Valley and the Mojave Desert to test the maintenance system for extensive operations and for conducting long range bombing and gunnery missions jointly by all units of the Wing. During this maneuver, Bombardment and Attack squadrons of the Wing were first scattered throughout the area of the maneuver, each operating from a separate airdrome under conditions which might exist at the very start of an emergency. In the three days of this phase, joint missions, coordinated by Wing and Group Headquarters, were carried out in which the various units rendezvoused en route and proceeded on to bomb targets which had been prepared in the Mojave Desert; then returning to their respective airdromes without landing.

The next phase included the assembling of the units of each Group at Group airdromes and further work along the same lines as the earlier missions, while the last phase required the squadrons to move back to their original airdromes and operate with additional assistance from supply and maintenance units.

For this maneuver, ground gunnery targets were prepared as well as two types of bombing targets. There were the conventional circular bombing targets and one target made in the shape and dimensions of a battleship outline, including the danger area around the ship. On each mission, the units flew from their assigned bases to the desert, bombed, individually or by flight, squadron or group salvos as prescribed, and then to simulate actual war operations returned to their respective airdromes without landing en route. This required that some of the units travel as far as 250 miles one way, and that they remain in the air for the entire mission, including bombing, as long as 3½ to 4 hours. Of course, it is realized that this period in the air is not exceedingly great, but it is believed that it is the first time that combined wing problems have been conducted over such a great distance with actual bombing included.

Aside from the tests of certain tactical problems, this maneuver was designed to test the effectiveness of the units in bombing by various methods. On some of the missions, bombs were released by individual planes with each bombardier operating his bomb sight. Other missions required the simultaneous dropping of all bombs from formations of all of the Bombardment squadrons in the 1st Wing. This so called "pattern bombing" was itself tried in several ways, in each of which, however, bombs were released from non-sighting planes when the bombs were observed leaving the plane which was designated to perform the sighting operation for the particular unit. Sometimes each flight would have one plane which performed all of the sighting operations for the flight. There were also squadron salvos for which only one sight in the squadron was used, and others for which one bombardier performed all sighting operations while the leading planes of the other flights operated their sights for range only. Finally, the Groups and the Wing repeated these various methods for the larger units, to arrive at conclusions as to the best methods for attacking targets under various conditions.

Following a short visit home, the 7th Group again found itself bivouacked at Muroc in the Mojave Desert, participating with the 17th Attack Group, its neighbor from March Field, in advanced bombing tests based on the results of the November bombing on the same targets. In this exercise, especial stress was placed on for-

mation and individual bombing, conducted with standard 300 and 100-pound practice bombs, together with improvised concrete bombs, weighing 600, 1100 and 2,000 pounds. At the conclusion of the maneuver, a Group mission, composed of two 9-plane squadrons, released squadron salvos of eighteen 300-pound live demolition bombs on the battleship target with excellent results.

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LIEUT.-COLONEL CLARENCE L. TINKER, AIR CORPS

Lieut.-Colonel Clarence L. Tinker, Commanding Officer of the 7th Bombardment Group, Hamilton Field, Calif., was born November 21, 1887, in Osage County, Oklahoma. He graduated in 1908 from the Wentworth Military Academy, and his first four years in the military service were spent as a third and second lieutenant of the Philippine Constabulary on the Island of Panay.

Appointed a second lieutenant of Infantry, April 24, 1912, he served with the 25th Infantry from June 7, 1912, to March 6, 1917; with the 18th Infantry, March 7 to June 1, 1917; with the 62nd Infantry, July 13, 1917, to June 8, 1918, and with the 35th Infantry, July 20, 1918, to March 13, 1919. He was promoted to 1st Lieutenant, July 1, 1916; to Captain, May 15, 1917; to Major, July 1, 1920, and to his present rank, August 1, 1935.

While on duty as Professor of Military Science and Tactics at the Riverside, Calif., Polytechnic High School and Junior College, he was detailed to the Air Service for flying training and, following the completion of the course at the Primary Flying School at March Field, Calif., on March 17, 1920, he was ordered to Post Field, Fort Sill, Okla., to pursue the course of instruction at the Air Service Observation School. Upon his graduation, he was rated "Airplane Pilot" as of October 14, 1921, and on November 25th of that year was transferred to the Air Service. He completed the course of instruction at the Field Artillery School of Fire, December 15, 1921, whereupon he received the additional rating of "Aerial Observer."

Assigned to station at Fort Riley, Kansas, Col. Tinker commanded the Air Service troops at that post from February 9, 1922, until the fall of 1924, when he was assigned as student at the Air Service Tactical School, Langley Field, Va. His completion of the course of instruction was followed by a year of duty as student at the Command and General Staff School at Fort Leavenworth, Kansas. Following his graduation from the latter school, he was detailed as Assistant Military Attache for Air to the American Embassy, London, Eng.

While on this duty, he was piloting a DH-4 over a marked course with Lieut.-Commander Robert A. Burg, U.S. Navy, as passenger. Shortly after leaving the Kenley Airdrome, the engine ceased to function and, unable to clear the farther crest of a valley over which he was flying, the plane crashed and immediately caught fire. Col. Tinker managed to free himself from the blazing plane and his first thought was to extricate his passenger, who was unable to free himself because of his injuries and because his parachute encumbered him. Making no headway on one side of the now blazing inferno, he tried the other side and was successful in freeing the badly injured Naval officer. Lieut.-Colonel Kenyon Joyce, the Military Attache, recommended Col. Tinker for the Distinguished Flying Cross.

After leaving the hospital in England, Col. Tinker returned to the United States and received further treatment for his injuries at the Walter Reed General Hospital. Upon restoration to duty, he was, for a period of eight months, on duty in the Office of the Chief of the Air Corps, Washington. In November, 1927, he was assigned to Kelly Field, Texas, as Assistant Commandant of the Advanced Flying School. He assumed command of the Advanced Flying School and of the 10th School Group from July 1, 1930., to August 6, 1930.

On October 15, 1930, Col. Tinker assumed command of Mather Field, Calif., and of the 20th Pursuit Group, and remained on this duty for exactly two years, when he was transferred to March Field, Calif., where, among other duties, he performed those of Executive Officer and Post Operations Officer. In June, 1933, he assumed command of the 17th Pursuit Group. Upon the occupancy of Hamilton Field, he was placed in command of this post and of the 7th Bombardment Group, in February, 1935.

Col. Tinker has passed the 4,000-hour mark in total flying time. On July 4, 1935, he flew across the continent in a Martin Bomber from Hamilton Field to Washington, D.C., in an elapsed time of 14 hours and 30 minutes, with stops at Salt Lake City, Omaha and Indianapolis. His return flight to Hamilton Field, on July 9th, was accomplished in 16 hours and 55 minutes, stops being made at Indianapolis, Scott Field, Denver and Salt Lake City.

During the GHQ Air Force Maneuvers in Florida in December, 1935, Col. Tinker led the 7th Provisional Bombardment Group in a flight from March Field, Calif., to Vero Beach, Fla., the distance of 2300 miles being accomplished in an elapsed time of 21 hours and 15 minutes.

On September 5, 1935, Col. Tinker, about to make a landing at March Field upon returning with 61 other airplanes of the 1st Wing, GHQ Air Force, from a mock air attack on the California Exposition Grounds at San Diego, noticed that his landing gear could not be lowered. Ordering his three passengers to jump, he contacted the ground by radio and was advised to go to Rockwell Field where expert mechanics were available. At Rockwell Field he glided in on the belly of the airplane, which suffered only slight damage.

For the heroism displayed by Col. Tinker in the rescue of Commander Burg, as previously mentioned, the War Department awarded him the Soldier's Medal.

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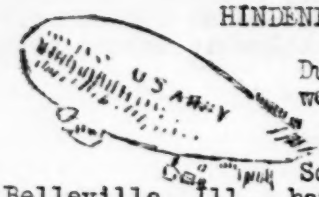
HINDENBURG VERSUS TC-14.



During the past few weeks, many visitors at the huge airship hangar at Scott Field, Belleville, Ill., have asked the military personnel how the U.S. Army airship TC-14, the world's largest non-rigid airship, compares in size, speed and structure with the new Hindenburg, which recently completed its second trans-Atlantic flight.

Comparing the two airships is much like comparing a wiener with a bologna. The Hindenburg has a length of 812 feet, more than three and one-half times that of the TC-14. The German ship's gas capacity is 6,609,000 cubic feet, eighteen times greater than the TC-14. When seen in the air, the huge size of the Hindenburg and the comparatively small size of the TC-14 are not realized because of distance and height. Visitors at the Scott Field airship hangar, when getting a close-up view of the 236-foot TC-14, realize that it is fairly large and fail to visualize the difference between it and the Hindenburg. A minute comparison will reveal a world of difference between the two airships.

Externally, the first difference that will be noticed is that the TC-14 control car is located almost centrally on the lower side of the envelope and that its three motors are attached directly onto the control car; two on outriggers, one at each side, and one just inside the rear end of the car with the propeller shaft extending to the outside. The Hindenburg's control car is located on the underside of the hull near the nose, and its four motors are located, two on each side, near the central portion of the airship. The power plant of the TC-14 totals 730 horsepower as against 4400 horsepower for the larger ship.

Another prominent difference is that the TC-14 has five tail surfaces, while the Hindenburg has only four. Of the TC-14's five surfaces, the upper one is a stabilizer, the two lateral ones are for elevation, and the two lower ones, set at approximately 45 degrees from the perpendicular, are for directional control. The Hindenburg has the four conventional tail surfaces; the upper one is a stabilizer, the two lateral ones are for elevation, and the lower is for directional control.

The TC-14 has a flat cone-shaped plate with a series of wooden battens attached to its nose, the purpose thereof being to give a pointed shape to the nose against the wind pressure in flight. The Hindenburg has the same type of cone-shaped plate which is built onto the interior framework and is not visible from the outside.

The real difference between the TC-14 and the Hindenburg is neither the size nor the external appearance but their basic structure. Like plants and animals, airships are continually undergoing evolution. The first aircraft were balloons inflated with wood smoke. These were followed during the next hundred years with various inventions for motorizing them. The first successful motorized balloons are known as the non-rigid type. They had no framework inside or along the bottom of the inflated envelope. The car is suspended on rigging attached either to the outside of the envelope itself or to catenary bands along the top inside of the envelope. This class of airship is most efficient in the size ranging from 30,000 to 400,00 cubic feet capacity. The TC-14, a 360,000 cubic-foot non-rigid craft, is just below the maximum size for this type.

The second class of airship design is known as the semi-rigid, a development just preceding the World War. This class of airship has a large inflated envelope, on the underside of which an aluminum framework, called a keel, extends from nose to tail. This keep is supported by rigging attached at numerous points to the inside of the envelope. The control car and motor gondolas are attached directly onto the keel itself. The size of this type of airship ranges from 400,000 to 1,000,000 cubic feet gas capacity.

The third class of airship is the rigid type, which was first designed and constructed by Count Zeppelin in the 1890's. The rigid airship has an aluminum framework which houses a number of separate gas cells and to which are attached the control car, motor gondolas and surfaces. Inside the framework there are, in addition to the gas cells, fuel tanks, water ballast tanks, freight storage rooms, airplane storage space and quarters. This type of airship is most efficient in size from 1,000,000 cubic feet gas capacity and upwards. To date the largest airship of this class which has been built is the Hindenburg.

The most necessary item in the structure of the TC-14 is, of course, the envelope, for without it there would be nothing to hold the lifting gas. In the case of the Hindenburg, the outside envelope serves only as a skin or cover for the airship, as the gas is stored in separate cells inside the aluminum framework. If the envelope were removed, the inside gas cells, storage tanks and other portions would be exposed to the weather - but the airship would rise. There would be, however, insurmountable difficulties in steering the airship without its outside envelope, because there would not be a great rush of

air over the tail surfaces. The motors would pull the ship forward in a straight course that could be changed only by the force of the winds.

Thus, in the case of the Hindenburg, while the envelope is not an absolute necessity for ascension, it is necessary for navigation and for the protection of the interior of the airship against the destructive effects of the outside air. Further, the shape of the airship envelope is important from the standpoint of efficiency in fuel consumption, speed and directional control. Both airships incorporate the latest improvements in streamlining, are gently and evenly rounded from nose to tail, and there is no great bulge near the nose. They are the latest developments in their respective lines. The Hindenburg has a maximum speed of 90 miles an hour against 85 m.p.h. for the TC-14; can carry 100 people, 7700 gallons of fuel and make a continuous flight of 8750 miles. The TC-14, with a fuel-carrying capacity of 1320 gallons, can carry 10 people and make a continuous flight of 2500 miles.

Regardless of their structural differences, they both resemble silvery cigars in the sky, and they are the very latest models in their particular class of transportation.

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RADIO TALK FROM AIRSHIP TC-13

During the recent celebration of the second birthday of the Junior Birdmen of America, a talk was broadcasted from the TC-13 airship at Moffett Field, Calif., and rebroadcasted by Station KYA, San Francisco. Major Bursette Palmer, Air Reserve, Field Director of the Junior Birdmen, held a two-way radio conversation with Station KYA, describing the organization and introducing Major Clarence B. Lober, Commanding Officer of the 19th Airship Squadron, Moffett Field, which operates this airship.

Explaining the construction and operation of the TC-13, Major Lober stated, in substance, that this airship was the only one operated on the west coast by our military service, and with its 360,000 cubic feet volume may appear as a toy compared with the 6,500,000 cubic feet volume of the former queen of the sky. While containing a little over 5% of the volume of the largest rigid airships thus far built in this country, this non-rigid airship has 25% the range and 90% the speed of the large ships and, due to several contributing factors, is able to withstand more severe weather conditions.

The envelope of the TC-13 is constructed of 3-ply rubberized cotton fabric, the shape of which is maintained by always having within a greater pressure than that of the surrounding air. Within the hull are two air chambers or ballonets, one toward the front, the other aft, the remaining and larger part of the hull containing helium. As the barometric pressure or density of the external air changes, due to variations in either or both weather and altitude, the difference between the internal and external pressures would vary if some adjustments were not made. To prevent excess pressure which, if too great, would burst the hull, pressure relief valves, seven of them, 20" in diameter, are connected to the air or gas spaces in the hull. To raise the internal pressure, scoops are provided behind the propellers, thus taking air into the hull, the pilot controlling its flow to either the forward or rear air chamber, as desired, to maintain proper balance. The airship car contains an engine-driven blower for the same purpose, used whenever the forward speed of the ship is too slow to permit use of the other method, such as in approach for a landing or while moored away from the hangar.

To the hull are affixed battens or ribs to stiffen the nose and control surfaces to obtain, dynamically, horizontal and vertical control in flight. The airship car is suspended from ten steel cables which extend obliquely upward through the hull to two longitudinal catenary cables fastened to the hull near the top by means of fabric curtains, one on either side of the center line.

The car, covered with fabric and aluminum sheet, and about 40 feet long, 8 feet wide and 10 feet high, is constructed of chrome-molybdenum steel tubing. The upper portion of the car contains twelve 110-gallon fuel or ballast tanks and two smaller tanks, one for engine oil and the other for water. Five of the tanks are provided with dump valves so that fuel or ballast may be released if it becomes necessary to reduce the weight of the ship to obtain static equilibrium, so that at low flight speed the ship would not lose altitude. Two are slip tanks, i.e., the entire tank with contents, weighing about 750 pounds, could be instantly dropped if added lift were needed in an emergency.

The normal crew of the TC-13 is nine. In the pilot's compartment the altitude pilot is seated on the left. Before him are controls for the seven gas or air valves in the hull, controls to govern the release of ballast, an inclimometer to indicate the angle of pitch of the ship, four manometers, one a liquid type for checking the three mechanical type instruments, one connected to each air chamber, and one to the gas chamber. Above these are mounted an airspeed meter, rate of climb indicator, and an altimeter. Besides these are the two engine throttles, the master ignition switch, the signal switch by which instructions can be given the engineer, the release for the landing ropes, and on the right a large wheel in

the fore and aft plane which the pilot is turning, checking the oscillations in pitch and smoothing out the flight path.

The direction pilot is seated behind a slanted wheel, much like that in an automobile, with a compass, drift meter, clock and radio compass indicator to keep him company. In a rack above the head of each pilot is his parachute, which can readily be attached to his harness. In a small box behind the direction pilot is a day's emergency ration for the crew. On a table are various navigation instruments and data to enable computations to be made of the position of the airship.

To the rear of the radio operator on the right side of the car is the bomber's seat, before which is the bomb sight, and to the right of which are the electrical controls, the operation of which will release bombs either singly or in salvo. On either side of the car, on outriggers, are mounted two Pratt and Whitney "Wasp" engines of 450 h.p. each, to which 3-bladed aluminum propellers of 12 foot diameter are attached. Between the outriggers, in the car, is seated the engineer, with the controls and instruments necessary to engine operation conveniently arranged about him. Behind him, on the left, is the radio transmitting equipment and, opposite, the galley with its water supply and electric hot plate arranged on a convenient cabinet, in which is stored the galley equipment. The remaining space to the rear is occupied by sleeping accommodations for four, and the well, out of which can be lowered the sub-cloud car. This is a streamlined affair just large enough to seat one person, and it can be lowered 1,000 feet below the airship, permitting the observer to report by telephone the presence, location and disposition of an enemy force, while the airship remains concealed in the clouds above.

Airships are peculiar in their ability to hover, i.e., to maintain their altitude without need for forward speed, and are noted for their long range and long flight duration. The TC-13 has been in commission three years, during which time it has been in flight nearly 2600 hours. Flights of 20 hours or over have been made once or twice each month during that period. In January, 1935, a flight was made from Langley Field, Va., to Miami, Fla., during the course of which the airship remained moored out on a portable mast for four days. Later in 1935, the ship was flown from Langley Field to Scott Field, near St. Louis, a distance of about 800 miles. In November of last year, it was flown from Langley Field to Moffett Field, Calif., via Shreveport, La.; San Antonio, El Paso, Texas; and March Field, Riverside, Calif. The first leg of this journey was over 1,000 miles.

Just about a month ago, the TC-13, piloted by Captain Lawrence A. Lawson, remained in the air over 76 hours, and landed with more than enough fuel for another 76 hours. A few days later, Capt. Lawson made an extended flight of over 1800 miles at an air speed of 85 miles per hour, landing with enough fuel for 580 more miles, or a total demonstrated range of 2380 miles under normal wind conditions. These are the characteristics of a real aircraft of military value. Of course, the speed of 76 miles per hour is low compared with that of modern airplanes, but speed is not an essential or even a desirable characteristic for the conduct of harbor patrols, scouting for submarines and mines, convoying surface craft, and similar missions.

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Lieut.-Colonel Frank M. Kennedy, Commanding Officer of Scott Field, Ill., commenced the annual summer airship night flying on May 14th, by making a 12-hour flight in the TC-14, on the St. Louis - Indianapolis radio beam, covering a distance of 500 miles. The TC-11 airship also flew 500 miles on a 12-hour flight the same night.

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BALLOON ACTIVITIES AT FORT SILL, OKLA.

Local weather conditions aiding, the 1st Balloon Squadron at Fort Sill, Okla., has been busy tucking flying hours under its belt. Any hour of the day finds the captive balloon aloft on a mission. Free ballooning has been very nearly as popular, each pilot of the squadron having placed to his credit at least one cross-country in the 19,000 and 35,000 cubic foot class. This activity is popular among the officers of the Field Artillery School at Fort Sill, each "hop" attracting many prospective passengers from the School, who are eager to try this new experience. Heavier-than-air pilots find these balloon trips instructive and pleasant in new experience.

May 7th was demonstration day at the big balloon hangar. The students of the Field Artillery School were given an extensive and comprehensive lecture and inspection tour covering the operation and handling of the observation balloon. Details included were field maneuvers, gassing the balloon, ground defense, telephone nets and photography. Officers of the School found the demonstration so satisfactory that it is to be included in the regular curriculum, which is quite complimentary.

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Major James H. "Jimmy" Doolittle, Air Reserve, recently completed two weeks of active duty in the Office of the Chief of the Air Corps, and was attached to Bolling Field for flying. On May 20th, Major Doolittle, along with several other officers attached to the Chief's office, attended the conference at Langley Field of the National Advisory Committee for Aeronautics.

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OBITUARIES

Fate decreed that Wright Field should lose two of its officers through airplane accidents - Captain William L. Scott, Jr., on May 17th, and Major Hez McClellan on May 25th.

A resident of the District of Columbia when he received a West Point cadet appointment, Captain Scott graduated from the U.S. Military Academy in June, 1923. Detailed to the Air Corps to undergo flying training, he graduated from the Primary Flying School, Brooks Field, Texas, March 25, 1924, and from the Advanced Flying School, Kelly Field, Texas, September 13, 1924, specializing in Bombardment. He was then assigned to station at Bolling Field, D.C., where he performed, among other duties, those of Assistant Engineering Officer. From September 9, 1929, to January 19, 1932, he was stationed at Rockwell Field, Calif., being Operations Officer of the 11th Bombardment Squadron.

From February 10, 1932, to December 28,1934, Captain Scott served a tour of duty in the Panama Canal Department, being assigned to the 25th Bombardment Squadron. For a little over six months thereafter he was stationed at Langley Field, Va., with the 96th Bombardment Squadron, serving as Armament Officer and Flight Commander. By virtue of holding the latter position, he was promoted to the temporary rank of Captain on April 2, 1935. He began his course of instruction at the Air Corps Engineering School at Wright Field during the latter part of July, last year.

Captain Scott was promoted to the regular rank of Captain on August 1, 1935. At the time of his untimely death he was 37½ years of age.

Major Hez McClellan, Air Corps, was considered a superior pilot, one with extensive experience in long-distance navigation flights. His assignment in November, 1935, as Chief of the Flying Branch, Materiel Division, Wright Field, Ohio, was in tribute to his exceptional ability as a pilot of all types of aircraft.

Born at Hall, Indiana, May 1, 1894, he attended grammar schools in his native city and Indianapolis, Ind.; graduated from high school at Indianapolis, and completed two years of study at Butler College in that city. He enlisted in the Aviation Section, Signal Corps, December 8, 1917; graduated from the School of Military Aeronautics, University of California, Berkeley, March 30, 1918, and, following a month's duty at the Aviation concentration camp at Camp Dick, Dallas, Texas, was ordered to Kelly Field, Texas, for his flying training, upon completion of which he was, on September 7, 1918, commissioned a second lieutenant and assigned to active duty at Kelly Field. Shortly thereafter he was assigned to duty as student at the Instructors School at Brooks Field, Texas, and, upon the completion of the course of instruction thereat, returned to Kelly Field for duty in the Flying Department as instructor.

Transferred to the Philadelphia District Ordnance Officer, Major McClellan, after a little over a year's duty at that station, was commissioned a second lieutenant in the Air Corps, Regular Army, July 1, 1920, and assigned to duty at the Primary Flying School at Carlstrom Field, Arcadia, Fla., as Flying Instructor. He remained with this School when it was transferred to Brooks Field, Texas, at that time holding the position of Stage Commander.

In August, 1926, Major McClellan was ordered to duty in the Philippines and, upon the completion of his two-year tour of duty in the Islands, was assigned to Mitchel Field, N.Y. From September, 1932, to June, 1933, he was a student at the Air Corps Tactical School at Maxwell Field, Ala. Following his graduation, he was assigned to station at Bolling Field, D.C.

Major McClelland qualified in aerial navigation and instrument flying, taking a course in instrument flying in 1934 at the School conducted at Wright Field, under the supervision of Major Albert F. Hegenberger, and the course in advanced air navigation at the School at Rockwell Field, Calif., during 1935.

In November, 1935, he was assigned to Wright Field, Dayton, Ohio, as Chief of the Flying Branch, and was given the temporary rank of Major.

Major McClellan participated in the flight of ten B-10 Martin Bombers from Washington, D.C., to Fairbanks, Alaska, and return, July 19 to August 20, 1934, serving in the capacity of Supply Officer. This flight involved a total distance estimated at approximately 8,290 miles, and was led by Lieut.-Colonel Henry H. Arnold, now Brigadier-General and Assistant Chief of the Air Corps.

From the period June 12 to August 14, 1935, Major McClellan, accompanied by Sergeant Tamosan and Corporal Krause, and piloting a Douglas C-29 Amphibian, accomplished an airplane reconnaissance of the routes to and from Alaska and throughout the territory of Alaska. During this period he flew on 38 days a total of 153 hours and 25 minutes, and secured a splendid photographic record of the places visited. The time on the ground was spent in ground reconnaissance, both visual and photographic, in necessary airplane maintenance, and in securing information from the inhabitants. Many of his flights in Alaska were truly pioneering in character. His was the first military airplane ever to land at Point Barrow, or to return from Point Barrow to Fairbanks over the route taken. This route was mostly over terrain uninhabited and for which the details of the map carried were entirely inadequate to afford a reasonable expectation of safe progress over the ground in the event of airplane failure. The terrain is among the most rugged, desolate and difficult of traversing on foot of any in the world.

Major McClellan, during this expedition, was on his own initiative. The comprehensive character of the survey made by him, as evidenced by the very excellent and complete report submitted by him covering this survey, gave ample evidence of the intrepidity and resourcefulness

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of this officer. The nature and extent of the flying accomplished was extremely hazardous and beyond the call of ordinary duty. The successful performance of these flights reaffirmed his distinguished ability as an exceptional pilot and as an officer of excellent professional attainments.

For this pioneering flight, Major McClellan was recommended for the award of the Distinguished Flying Cross. His total flying time was well over the 5,000-hour mark.

The Air Corps extends its sincere sympathy to the bereaved families of the deceased officers.

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CATERPILLARS

The latest entrant into the mythical aeronautical fraternity of Caterpillars is 2nd Lt. Frank J. Bennett, Air Reserve, 36th Pursuit Squadron, GHQ Air Force, Langley Field, Va., who was forced to "bail out" of a P-12F type airplane at about 3,000 feet, due to a broken oil line and subsequent engine failure.

Lieut. Bennett was returning from Danville, Va., on a night navigation training mission and was about 18 miles out when the failure occurred. The airplane crashed in a ravine near Spring Garden, Va., and was completely wrecked. The pilot drifted to earth with his parachute about a mile from the wrecked airplane, landing in a small field, and was uninjured. He states that when he realized he had to jump he had no apprehension. It all seemed perfectly normal and natural. Due to the darkness, he had no sensation of descent until very near the ground. His flashlight was of considerable help upon landing.

Flying Cadet James L. Bledsoe, of the Pursuit Section of the Air Corps Advanced Flying School, was returning from a student night cross-country training flight on May 11th, when his engine developed trouble. Returning from Fort Clark, Texas, at an altitude of approximately 2,000 feet, Cadet Bledsoe had reached a point about three miles southeast of Hondo, Texas, when his engine suddenly quit. Although he had gasoline remaining in his auxiliary tank, he changed to his main tank and used the wobble pump in an effort to regain his engine. It caught again and ran for only a few minutes before it stopped the second time. Cadet Bledsoe dropped one flare and saw what he thought was a satisfactory emergency field. When directly over this field he released his second flare, which failed to ignite. Having insufficient illumination for a landing, he climbed out onto the wing and was in the act of leaving the airplane when the engine again picked up. He was unable to regain his position in the cockpit or control the airplane from his position on the wing, so the two soon parted company. He landed without injury and promptly notified the officials at Kelly Field. The airplane, of course, was completely demolished.

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GRADUATION [illegible] FOR ADV. FLYING SCHOOL CLASS

The students of the present class at the Advanced Flying School, Kelly Field, Texas, consisting of 9 officers and 53 Flying Cadets, are scheduled to graduate on Wednesday, June 17, 1936. Graduation Review is scheduled at 9:30 a.m., and Graduation Exercises at the post theatre will take place at 10:45. All of the students are anxiously awaiting word as to their assignment to station. The Cadets in particular are concerned, because the majority of them have made application for commission in the Regular Army, in compliance with the provisions of Circular No. 20.

The Pursuit Section of the Air Corps Advanced Flying School departed on May 18th on their maintenance navigation training flight, which took them through Barksdale Field, La.; Fort Sill, Okla.; Lubbock, Texas; Roswell, New Mexico; Fort Bliss, Marfa, Dryden and Fort Clark, Texas. Upon arrival at Fort Sill, Cadet J.V. Boyer became so ill from exposure to poison ivy that it was necessary to dispatch the airplane ambulance from Kelly Field to his assistance. The ambulance was flown by Captain R.C. Rhudy, who was accompanied by Lieut. J.E. Blair. The latter flew Cadet Boyer's plane back to Kelly Field.

The personnel of the Attack Section of the School departed on their maintenance navigation training flight on May 20th, their route being Kelly Field to Abilene, Texas; Fort Sill, Okla.; Midland, Texas; Carlsbad, New Mexico, Fort Bliss, Texas, and return by way of Dryden, Tex.

The Bombardment and Observation Sections were scheduled to depart on May 25th and June 1st, respectively, and to follow approximately the same itinerary as the other Sections. Due to the shortage of airplanes at Kelly Field, it will probably be necessary to split the Bombardment Section into two flights, in which event the second flight will depart on June 3rd.

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During the recent Fiesta San Jacinto in San Antonio, the usual pilgrimage was made to the Alamo, the Shrine of Texas Liberty. The march to the old fort was made on foot and was participated in by many officials and citizens of all classes from all over the State, bearing floral tributes to the Shrine. Each Army station in San Antonio and vicinity was represented by an enlisted man. The San Antonio Air Depot was represented by Sergeant H.R. Riley, of the 3rd Transport Squadron, who carried a large wreath, prepared by Major Walter Hitzfeldt, Post Quartermaster, and composed of the gorgeous flowers of every hue which grow in such variety and profusion at that station. In this wreath, the words "Duncan Field" were worked out in flowers.

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The thanks of the News Letter is extended to Sergeant Lindquist, Air Corps, Connecticut National Guard, for the cover design featuring this issue of the News Letter. Sergeant Lindquist contributed a cover design on a previous occasion, and we hope to hear from him again.